

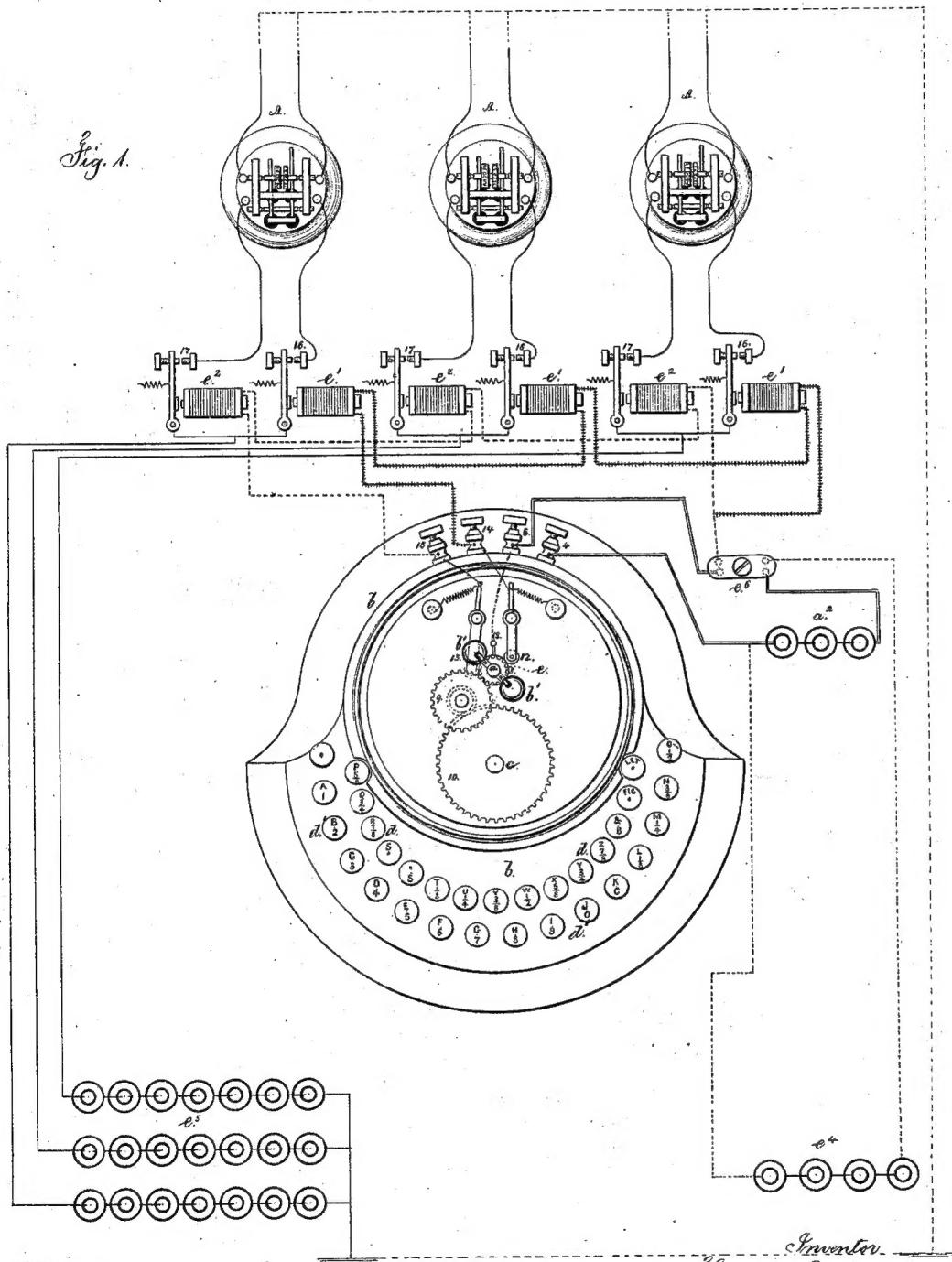
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T. A. EDISON.

## Improvement in Transmitters and Circuits for Printing-Telegraphs.

No. 131,343.

Patented Sep. 17, 1872.



### Witnesses

Chas C. Smith  
Harold Penell

*Inventor*  
Tho: a. Edison,  
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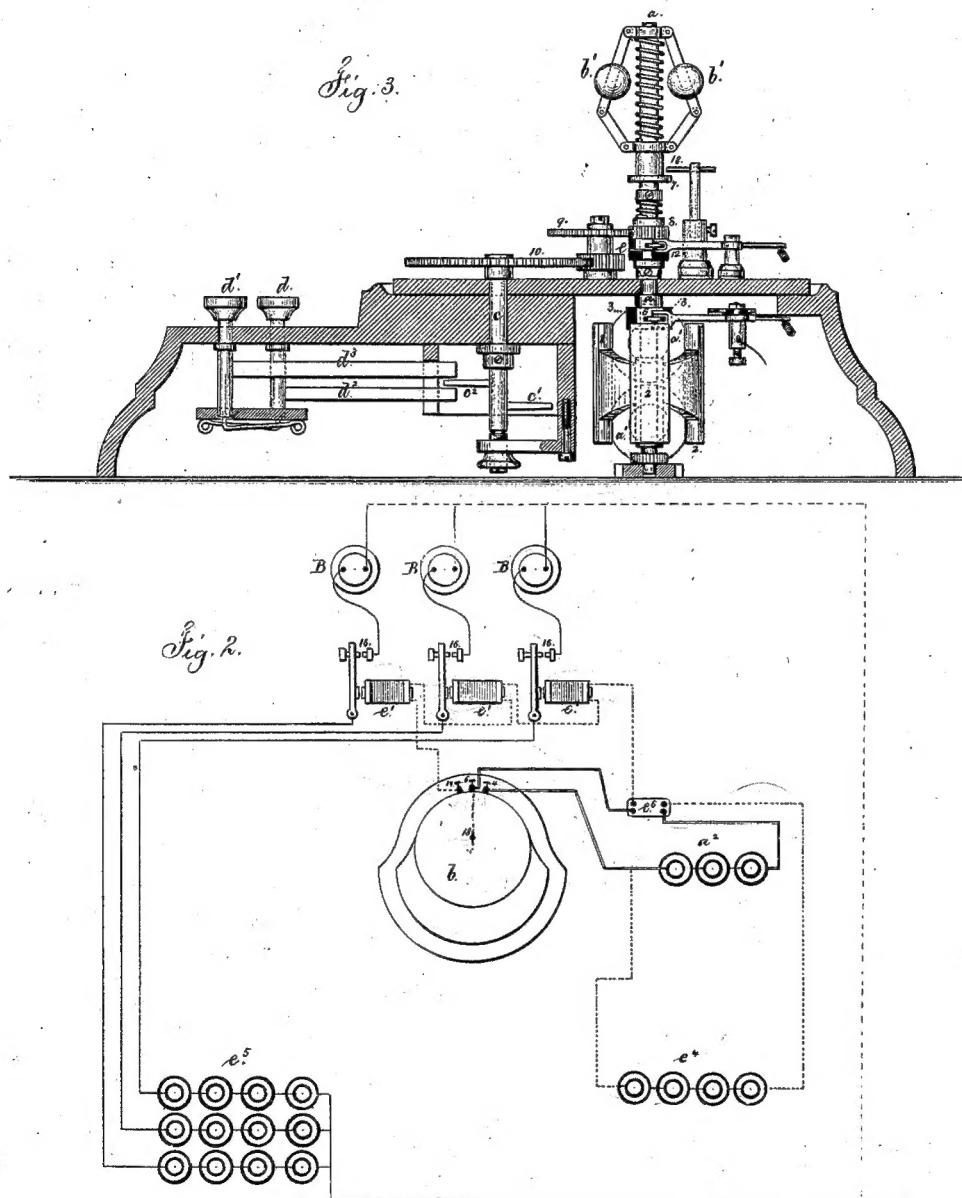
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# UNITED STATES PATENT OFFICE.

THOMAS A. EDISON, OF NEWARK, NEW JERSEY.

## IMPROVEMENT IN TRANSMITTERS AND CIRCUITS FOR PRINTING-TELEGRAPHS.

Specification forming part of Letters Patent No. 131,343, dated September 17, 1872.

*To all whom it may concern:*

Be it known that I, THOMAS ALVA EDISON, of Newark, in the State of New Jersey, have invented an Improvement in Printing-Telegraphs, and the following is declared to be a correct description of the same.

The first part of this improvement relates to a machine that is termed a "transmitter," in which there are finger-keys or stops that are allotted to the respective characters employed. There is also in this instrument a "pulsator," that makes and breaks an electric circuit passing through a range of relay-magnets and opens and closes these until the pulsator is stopped by the depression of one of the finger-keys. The second part of this invention relates to the arrangement of the respective electric circuits that connect this transmitter with the relay-magnets and the circuits that are operated by those relay-magnets and pass through the printing-telegraph instruments, a number of these instruments being placed in each circuit, so that one transmitting instrument will operate in unison any number of printing-telegraph instruments to the extent of hundreds, and in case of defect in any one local circuit the other circuits will not be disarranged.

In Figure 1 a plan of the transmitter is shown, also a diagram representing the circuits to the relay-magnets and printing instruments, in which two wires are employed, one wire and circuit to the type-wheel magnets, the other to the printing-magnets. In Fig. 2 a diagram is shown of the transmitter and circuits to printing-telegraph instruments, operated by one wire and electric circuit; and Fig. 3 represents the transmitting instrument by a vertical section.

The shaft *a* of the transmitting instrument is preferably revolved by magnetism. For this purpose two stationary magnets are used, one of which, *a*<sup>1</sup>, is seen in Fig. 3; and there are three armatures, 2 2 2; and upon the shaft *a* is a circuit-breaker, 3, of alternate conducting and non-conducting material, that opens and closes the circuit to the magnets *a*<sup>1</sup> alternately, so as to attract the armatures successively and revolve the shaft *a*. The battery *a*<sup>2</sup> operates this motor, the wires being connected at 4 to the bed *b* of the machine, and at 5 to the insulated binder, and from that to the magnets *a*<sup>1</sup> and to the lever and roller 6 of the respective pulsators, thence through the shaft *a* and bed

*b* to 4. Upon the shaft *a* are governor-balls *b*', that rise by increased speed and bring the flange 7 of the sliding sleeve into contact with the adjustable insulated arm 18, Fig. 3; and from this a wire connects with 5, thereby the electricity will be "short circuited," passing through 4, *b*, *a*, 7, 18, and 5, instead of going through the electro-magnets *a*<sup>1</sup>, thus lessening the power and the speed, and maintaining uniformity in the revolution of the motor. By the gearing 8 9 10 the shaft *c* is revolved with the desired speed. It has two arms, *c*<sup>1</sup> *c*<sup>2</sup>, on opposite sides, one above the other, and these act in connection with the two semicircular ranges of finger-keys *d* *d*<sup>1</sup>. Beneath the bed *b* these finger-keys have arms *d*<sup>2</sup> *d*<sup>3</sup> converging toward the center of *c*, and when one of the keys *d*<sup>1</sup> is depressed its arm *d*<sup>3</sup> stops the arm *c*<sup>2</sup>, shaft *c*, and gears 8 9 10. The gear 8 is driven by friction, hence the motor and shaft *a* continue to revolve; but connected with the gear 8 is a pulsator, *e*, made of alternate conducting and non-conducting surfaces, and these open and close the circuits to the distant printing instruments or to the relay-magnets. By bearing in mind that the parts are made so that the pulsator *e* transmits the necessary number of pulsations to make a complete revolution of the type-wheels at the distant instruments by a step-by-step movement, each complete revolution of the shaft *c*, it will be understood that the shaft *c* and the type-wheels revolve in harmony, and that when the shaft *c* is stopped by one of the keys *d* or *d*<sup>1</sup> the type-wheels of the distant instruments are stopped, and the position of the characters on the type-wheels must be in harmony with the arrangement of the keys *d* *d*<sup>1</sup>, and when the key is liberated the shaft *c* and pulsator *e* resume their revolution, and the distant type-wheels also resume the synchronous movement. The printing-telegraph machines illustrated at A A are operated by two wires. Those shown at B B, Fig. 2, are operated by one wire; hence with two-wire instruments two ranges of relay-magnets, *c*<sup>1</sup> *c*<sup>1</sup> and *c*<sup>2</sup> *c*<sup>2</sup>, will be required, while only the range *c*<sup>1</sup> of relay-magnets will be needed with one-wire instrument. When two ranges of relay-magnets are used there are two rollers, 12 and 13, on insulated spring-levers. One is connected to the binding-screw 14, the other to the binder 15, and the parts are po-

sitioned so that the pulsator  $e$ , as it revolves, opens and closes the circuit from the battery  $e^4$  through the relay-magnet  $e^1$  to make and break the circuits at 16, from the batteries  $e^5$  through the type-wheel electro-magnets in the distant instruments A. The relay-magnets  $e^2$  will not respond although the circuit is closed by the roller 13, because the springs of the armatures of the electro-magnets  $e^2$  are under considerable tension; but when the pulsator  $e$  is stopped by depressing one of the keys the roller 12 rests upon a non-conducting surface, breaking the circuit through  $e^1$ , and the roller 13, resting on a conductor, closes the circuit through the relays  $e^2$ , causing them to close the circuits at 17 of the batteries  $e^5$ ; hence they act in the distant instruments A in the electro-magnets that effect the printing. The pulsator  $e$ , when employed with the single range of relay-magnets  $e^1$ , as in Fig. 2, causes the pulsations to be repeated at 16 from the batteries  $e^5$  to the distant instrument, and when the printing is effected by a pause on a closed circuit, the pulsator  $e$  is stopped with the roller 12 in contact with the metallic portion of the pulsator; but if the printing is effected by a pause upon an open circuit the roller 12 is in contact with a non-conducting portion of the pulsator  $e$ . I have shown the battery  $e^5$  in three sections connected with the respective relay-magnets and with three relay-circuits. In each of

these relay-circuits there may be any desired number of printing-telegraph instruments, and the circuits are completed through the ground connections. The circuits to the transmitting instrument and the relay-magnets may be disconnected by a switch at  $e^6$ , that may be turned around to throw both batteries out of action, and the circuits from the batteries  $e^5$  will also be broken at the relay-magnets.

I claim as my invention—

1. The pulsator  $e$ , driven by friction, in combination with the ranges of finger-keys and the arms  $e^1 e^2$ , substantially as and for the purposes set forth.

2. The revolving pulsator  $e$  in combination with the relay-magnets and connections of the local and main-line circuits, substantially as set forth, for actuating the printing-telegraph instruments in their respective circuits, substantially as set forth.

3. The governor  $b'$  and flange 7, in combination with the circuit connections to the magnets of the motor, substantially as and for the purposes set forth.

Signed by me this 10th day of June A. D. 1872.

T. A. EDISON.

Witnesses:

GEO. T. PINCKNEY,  
CHAS. H. SMITH.